Operating Instructions

Submersible pressure transmitter with ceramic measuring cell

VEGAWELL 52

4 … 20 mA

Document ID: 35401

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Supplementary documentation

Information:
Supplementary documents appropriate to the ordered version come with the delivery. You can find them listed in chapter "*Product description*".

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1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

This operating instructions manual is directed to trained specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbols used

Information, tip, note
This symbol indicates helpful additional information.

Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

Ex applications
This symbol indicates special instructions for Ex applications.

SIL applications
This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

→ **Action**
This arrow indicates a single action.

1 **Sequence of actions**
Numbers set in front indicate successive steps in a procedure.

Battery disposal
This symbol indicates special information about the disposal of batteries and accumulators.

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2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

2.2 Appropriate use

Model VEGAWELL 52 is a pressure transmitter for level and gauge measurement.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about incorrect use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and guidelines. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

The safety approval markings and safety tips on the device must also be observed.

2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

2.6 CE conformity

This device fulfills the legal requirements of the applicable EC guidelines. By attaching the CE mark, VEGA provides a confirmation of successful testing. You can find the CE conformity declaration in the download area of "www.vega.com".

2.7 NAMUR recommendations

NAMUR is a user association for automation technology in the process industries in Germany. Several of its key activities are defining standards as well as setting user requirements on new devices, systems and technologies. The published NAMUR recommendations (NE) are accepted as the standard in field instrumentation.

The device fulfills the requirements of the following NAMUR recommendations:

- NE 21 – Electromagnetic compatibility of equipment
- NE 43 – Signal level for malfunction information from measuring transducers

2.8 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.9 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfill this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGAWELL 52 pressure transmitter with suspension cable
- optionally available with straining clamp, screwed connection or housing with cable locking
- Documentation
  - this operating instructions manual
  - Test certificate
  - Supplementary instructions "*Suitable for drinking water*" (optional)
  - Ex-specific "*Safety instructions*" (with Ex versions)
  - if necessary, further certificates

Constituent parts

VEGAWELL 52 with suspension cable consists of the following components:

- Transmitter
- Suspension cable
- Optional fastening element or housing with threaded fitting

The components are available in different versions.

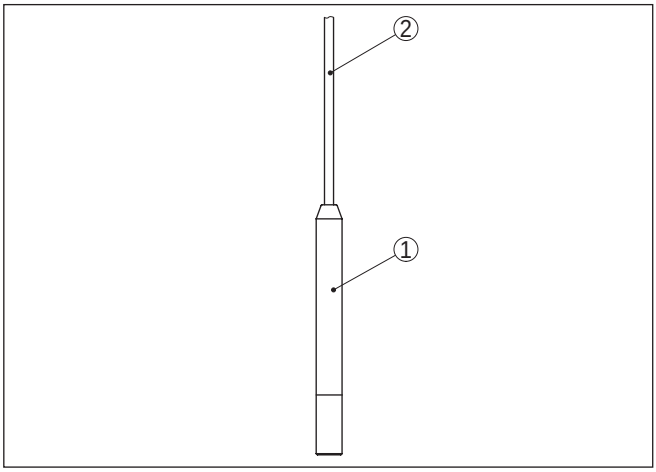

Fig. 1: Example of a VEGAWELL 52 with transmitter 22 mm

1 Transmitter
2 Suspension cable

Type label

The type label contains the most important data for identification and use of the instrument:

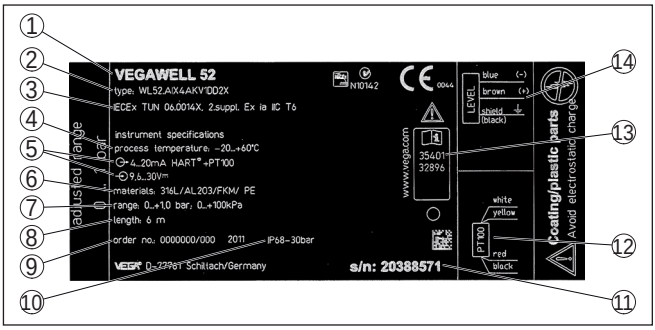

Fig. 2: Structure type label VEGAWELL 52 (example)

1 *Instrument type*
2 *Product code*
3 *Approvals*
4 *Process temperature*
5 *Signal output/Operating voltage*
6 *Materials Transmitter/Measuring cell/Measuring cell seal/Suspension cable*
7 *Measuring range*
8 *Cable length*
9 *Order number*
10 *Protection rating*
11 *Serial number of the instrument*
12 *Assignment suspension cable, temperature*
13 *ID numbers, instrument documentation*
14 *Assignment suspension cable, level*

Serial number - Instrument search

The type label contains the serial number of the instrument. With it you can find the following instrument data on our homepage:

- Product code (HTML)
- Delivery date (HTML)
- Order-specific instrument features (HTML)
- Operating instructions at the time of shipment (PDF)
- Test certificate (PDF) - optional

Go to www.vega.com, "*VEGA Tools*" and "*Instrument search*". Enter the serial number.

Alternatively, you can access the data via your smartphone:

- Download the smartphone app "*VEGA Tools*" from the "*Apple App Store*" or the "*Google Play Store*"
- Scan the Data Matrix code on the type label of the instrument or
- Enter the serial number manually in the app

3.2 Principle of operation

Application area

Model VEGAWELL 52 is suitable for continuous level measurement of liquids. Typical applications are measurements in water/waste water facilities, deep wells and in the shipbuilding industry.

Functional principle

The actual sensor element is the CERTEC® measuring cell with rugged ceramic diaphragm. The hydrostatic pressure causes a capacitance change in the measuring cell via the ceramic diaphragm. This change is converted into an appropriate output signal.

Seal concept

As a standard feature, the CERTEC® measuring cell is equipped with a lateral, recessed seal.

Instruments with double seal have an additional front seal.

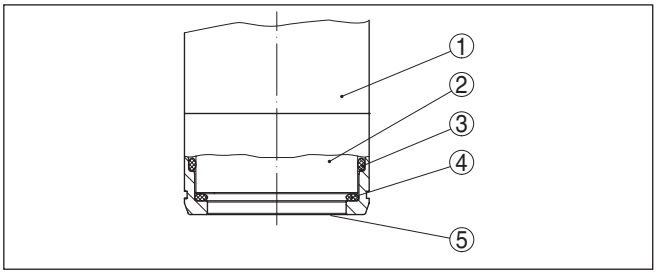

Fig. 3: Front-flush installation of the CERTEC® measuring cell with double seal

1 Housing, transmitter
2 Measuring cell
3 Lateral seal for measuring cell
4 Additional, front seal for measuring cell
5 Diaphragm

Voltage supply

4 … 20 mA two-wire electronics for voltage supply and measured value transmission on the same cable.

The data for power supply are specified in chapter "*Technical data*".

3.3 Operation

VEGAWELL 52 with 4 … 20 mA electronics has no adjustment options.

3.4 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

3.5 Accessories and replacement parts

VEGABOX 03

The VEGABOX 03 is a breather housing for VEGAWELL 52. The housing contains a filter element for ventilation.

You can find further information in the operating instructions "*Breather housing with ventilation filter*" (Document-ID 45925).

VEGADIS 82

The VEGADIS 82 is suitable for measured value indication of 4 … 20 mA sensors. It is looped into the signal cable.

You can find further information in the operating instructions "*VEGADIS 82*" (Document-ID 46591).

Measuring instrument holder

The measuring instrument holder is used for wall/tube mounting of VEGABAR series 80 pressure transmitters and VEGAWELL 52 submersible pressure transmitters. Supplied reducers enable the adaptation to different instrument diameters. The material used is 316L.

You can find additional information in the operating instructions "*Mounting accessory pressure*" (Document-ID 43478).

Mounting bracket

The robust, heavy-duty bracket of 1.4301/304 is designed for wall mounting VEGA instruments. The required fastening elements are included in the shipment.

4 Mounting

4.1 General instructions

Suitability for the process conditions

Make sure that all parts of the instrument coming in direct contact with the process, especially the sensor element, process seal and process fitting, are suitable for the existing process conditions, such as process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" and on the nameplate.

Installation position

Lateral movements of the transmitter can cause measurement errors. For this reason, mount the instrument in a calm area or in a suitable protective tube.

Pressure compensation

The suspension cable has a capillary for atmospheric pressure compensation. Therefore lead the cable end into a dry environment or a suitable terminal housing, for example VEGABOX 03 or VEGADIS 82.

Mounting example

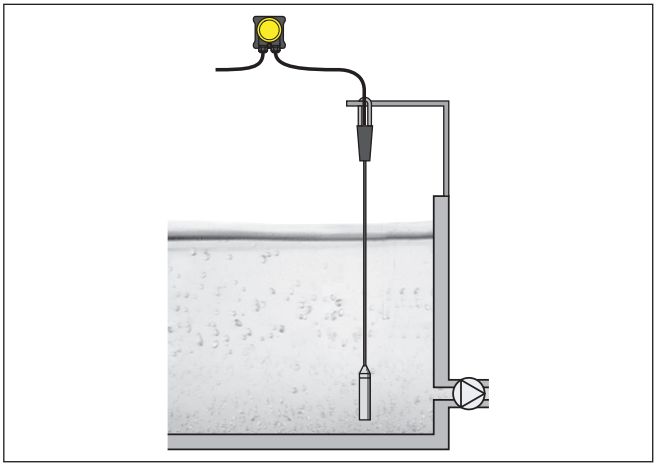

Fig. 4: Mounting example: VEGAWELL 52 in an open basin with breather housing VEGABOX 03

4.2 Mounting steps with straining clamp

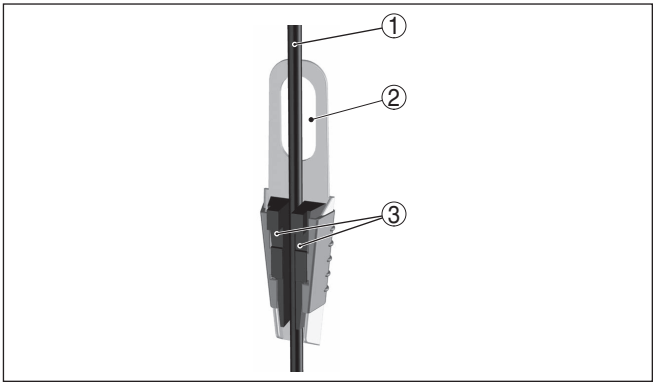

Fig. 5: Straining clamp

1 Suspension cable
2 Suspension opening
3 Clamping jaws

Mount VEGAWELL 52 with straining clamp as follows:

1. Hang the straining clamp on a suitable wall hook
2. Lower VEGAWELL 52 to the requested height
3. Slide the clamping jaws upward and push the suspension cable between them
4. Hold the suspension cable, push the clamping jaws downward and fix them with a light blow

Disassembly is carried out in reverse order.

4.3 Mounting steps with screwed connection

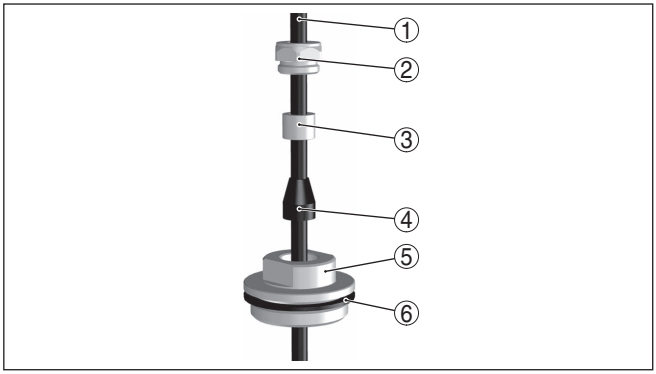

Fig. 6: Threaded fitting

1 Suspension cable
2 Sealing screw
3 Cone bushing
4 Seal cone
5 Threaded fitting
6 Seal

Mount VEGAWELL 52 with screwed connection as follows:

1. Weld the welded socket into the vessel top
2. Lower VEGAWELL 52 to the requested height by means on the welded socket G1½ or 1½ NPT on the vessel side
3. Shift the suspension cable from below through the opened threaded fitting
4. Slide the sealing cone and the cone sleeve over the suspension cable, fasten manually with the seal screw
5. Screw the screwed connection into the socket, tighten with SW 30 and then tighten seal screw with SW 19

How to correct the height:

1. Loosen seal screw with SW 19
2. Slide seal cone and cone sleeve to the requested position on the cable
3. Fasten the seal screw

Disassembly is carried out in reverse order.

4.4 Mounting steps with threaded connection or housing

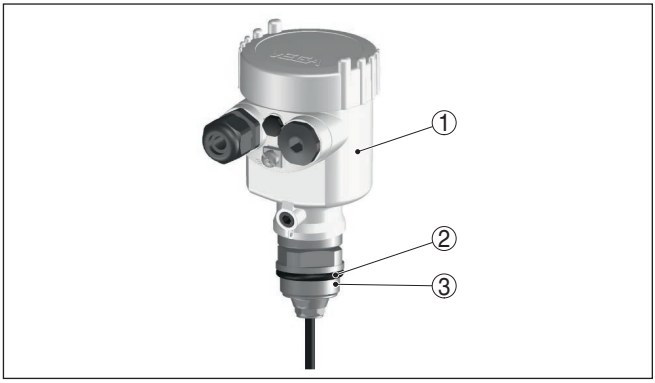

Fig. 7: Plastic housing

1 Housing
2 Seal
3 Thread

Mount into the vessel

Mount VEGAWELL 52 as follows:

1. Weld the welded socket G1½ A or 1½ NPT to the vessel top
2. Shift transmitter through the mounting boss
3. Turn the thread with seal into the socket and tighten with SW 46[1)]

Disassembly is carried out in reverse order.

Mounting into the basin

Mount VEGAWELL 52 as follows:

1. Fasten the mounting bracket at the suitable height on the basin wall
2. Lead the transmitter through the opening of the mounting bracket and the counter nut
3. Fasten counter nut with SW 46 on the thread

[1)] Seal with resistant material with thread 1½ NPT.

5 Connecting to power supply

5.1 Preparing the connection

Safety instructions

Generally connect the instrument only in the complete absence of line voltage.

The instrument is equipped with an integrated overvoltage protection. For additional protection of the signal circuit, we recommend further external overvoltage arresters.

- Type B63-48 (use with VEGAWELL 52 with plastic housing) or
- Type ÜSB 62-36G.X (use in a separate housing)

Take note of safety instructions for Ex applications

In hazardous areas you must take note of the respective regulations, conformity and type approval certificates of the sensors and power supply units.

Select power supply

Power and current signal are carried on the same 2-wire conductor in the suspension cable. The voltage supply range can differ depending on the instrument version.

The data for power supply are specified in chapter "*Technical data*".

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

VEGA power supply units VEGATRENN 149AEx, VEGASTAB 690, VEGADIS 371 as well as all VEGAMETs meet this requirement. When using one of these instruments, protection class III is ensured for VEGAWELL 52.

Keep in mind the following additional factors that influence the operating voltage:

- Output voltage of the power supply unit can be lower under nominal load (with a sensor current of 20.5 mA or 22 mA in case of fault message)
- Influence of additional instruments in the circuit (see load values in chapter "*Technical data*")

Select installation cable

The instrument is connected with standard two-wire installation cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Use cable with round cross-section. A cable outer diameter of 5 … 9 mm (0.2 … 0.35 in) ensures the seal effect of the cable gland. If you are using cable with a different diameter or cross-section, exchange the seal or use a suitable cable gland.

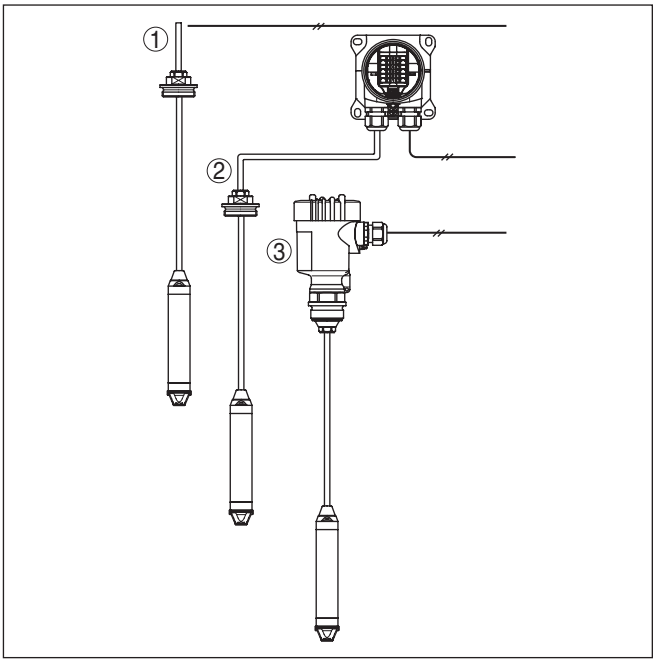

Fig. 8: Connect VEGAWELL 52 to power supply

1 Direct connection
2 Connection via VEGABOX 03
3 Connection via housing

Cable screening and grounding

If screened cable is required, we recommend connecting the cable screen on both ends to ground potential. In the connection housing of the sensor or in VEGABOX 03, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

In Ex systems, the grounding is carried out according to the installation regulations.

In electroplating and CCP systems (cathodic corrosion protection) it must be taken into account that significant potential differences exist. This can lead to unacceptably high currents in the cable screen if it is grounded at both ends.

Information:

The metallic parts of the instrument (process fitting, transmitter, concentric tube, etc.) are conductively connected with the inner and outer ground terminal on the housing. This connection exists either directly via connecting metallic parts or, in case of instruments with external electronics, via the screen of the special connection cable.

You can find specifications on the potential connections inside the instrument in chapter "*Technical data*".

5.2 Connection procedure

Direct connection

Proceed as follows:

1. Wire the suspension cable up to the connection compartment[2)]
2. Connect the wire ends to the screw terminals according to the wiring plan

Connection via VEGABOX 03

Connect the VEGAWELL 52 according to the description in the operating instructions of VEGABOX 03.

5.3 Wiring plan

Direct connection

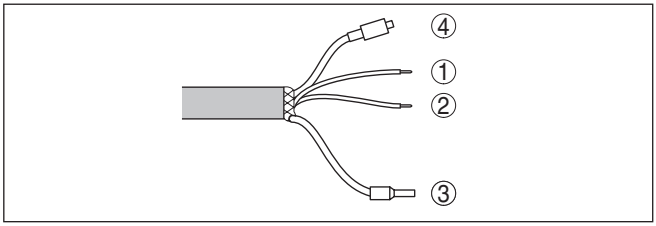

Fig. 9: Wire assignment, suspension cable

1 Blue (-): to power supply or to the processing system
2 Brown (+): to power supply or to the processing system
3 Shielding
4 Breather capillaries with filter element

Connection via VEGABOX 03

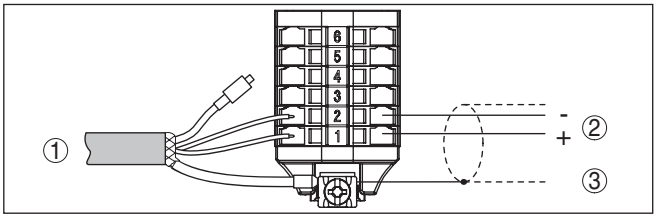

Fig. 10: Wiring plan VEGAWELL 52 for 4 … 20 mA, 4 … 20 mA/HART

1 To the sensor
2 To power supply or the processing system
3 Shielding[3)]

Wire number	Wire colour/Polarity	Terminal
1	brown (+)	1
2	blue (-)	2
	Shielding	Grounding

[2)] The suspension cable is already preconfectioned. After shortening the suspension cable, fasten the type plate with support again to the cable.
[3)] Connect screen to ground terminal. Connect ground terminal on the outside of the housing to ground as prescribed. The two terminals are galvanically connected.

Connection via housing

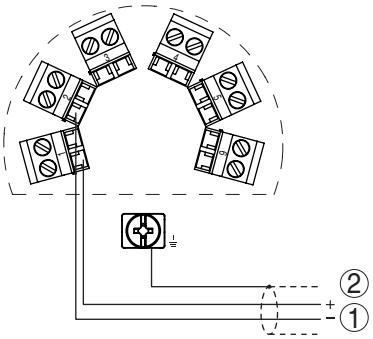

Fig. 11: Wiring plan housing

1 To power supply or the processing system

Connection via VEGADIS 82

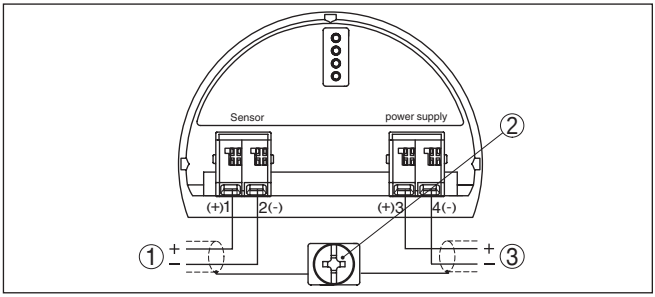

Fig. 12: Wiring plan VEGAWELL 52 for 4 … 20 mA sensors

1 To the sensor
2 Terminal for connection of the cable screen
3 For power supply

Wire number	Wire colour/Polarity	Terminal VEGADIS 82
1	brown (+)	1
2	blue (-)	2
	Shielding	Ground terminal

5.4 Switch-on phase

After connecting VEGAWELL 52 to power supply or after a voltage recurrence, the instrument carries out a self-check:

- Internal check of the electronics
- 4 … 20 mA output jumps to the failure signal

After the run-up period (specification see "*Technical data*"), the instrument delivers an output signal of 4 … 20 mA. The value corresponds to the actual level as well as the settings already carried out, e.g. factory setting.

6 Maintenance and fault rectification

6.1 Maintenance

Maintenance

If the instrument is used properly, no special maintenance is required in normal operation.

In some applications, product buildup on the diaphragm can influence the measuring result. Depending on the sensor and application, take precautions to ensure that heavy buildup, and especially a hardening thereof, is avoided.

Cleaning

If necessary, clean the diaphragm. Make sure that the materials are resistant against the cleanig, see resistance list under "*Service*" on "www.vega.com".

6.2 Rectify faults

Reaction when malfunctions occur

The operator of the system is responsible for taking suitable measures to rectify faults.

Causes of malfunction

VEGAWELL 52 offers maximum reliability. Nevertheless, faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Voltage supply
- Signal processing

Fault rectification

The first measure to take is to check the output signal. In many cases, the causes can be determined this way and the faults quickly rectified.

24 hour service hotline

Should these measures not be successful, please call in urgent cases the VEGA service hotline under the phone no. **+49 1805 858550**.

The hotline is manned 7 days a week round-the-clock. Since we offer this service worldwide, the support is only available in the English language. The service is free, only standard call charges are incurred.

Check the 4 … 20 mA signal

Connect a multimeter in the suitable measuring range according to the wiring plan.

Error code	Cause	Rectification
4 … 20 mA signal not stable	No atmospheric pressure compensation	– Check the capillariy and cut it clean
		– Check the pressure compensation and clean the filter element, if necessary

Error code	Cause	Rectification
4 … 20 mA signal missing	Wrong connection to voltage supply	– Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*"
	No power supply	– Check cables for breaks; repair if necessary
	Operating voltage too low or load resistance too high	– Check, adapt if necessary

In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Set up*" may have to be carried out again.

6.3 Shorten suspension cable

Shorten the suspension cable individually. Proceed as follows:

1. Remove the filter adapter from the capillary line
2. Cut the suspension cable to the requested length with side cutters

Caution:
Do not squeeze the capillary cable, as this will impair the pressure compensation. If necessary, rework the capillary with a sharp knife.

3. Remove approx. 10 cm of the cable mantle, strip off approx. 1 cm of insulation from the ends of the wires
4. Insert the filter adapter

The work steps are finished.

6.4 Shorten suspension cable - Version with housing

The suspension cable can be shortened individually. For the version with plastic or stainless steel housing proceed as follows:

1. Unscrew the housing cover
2. Loosen the screw terminals and remove the wire ends of the suspension cable out of the screw terminals
3. Hold the hexagon on the screwed socket with SW 46 and loosen with seal screw SW 22

Caution:
Seal screw is secured with Loctide pink, mote breakaway torque!

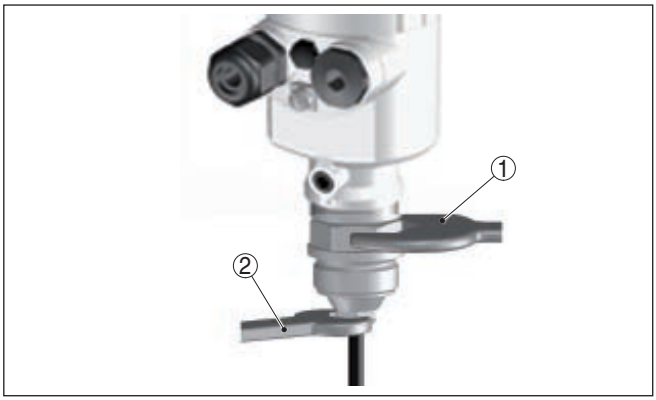

Fig. 13: Step 4

1 SW 46
2 SW 22

4. Pull the suspension cable out of the screwed socket, remove the pressure screw, cone sleeve and seal cone from the cable
5. Remove the filter adapter from the capillary line

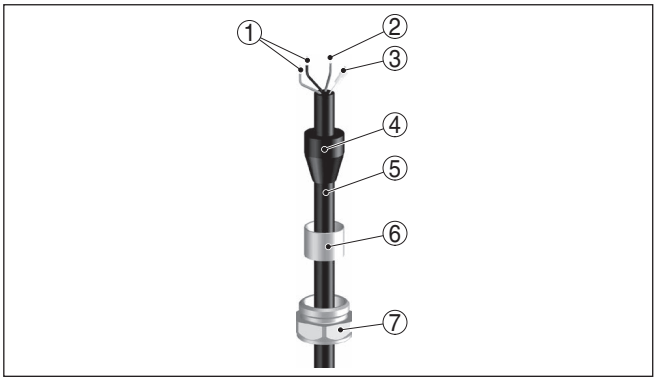

Fig. 14: Configuration of the cable seal

1 Connection cable (up to 6 pieces depending on the version)
2 Cable screening
3 Breather capillaries with filter element
4 Seal cone
5 Suspension cable
6 Cone bushing
7 Sealing screw

6. Cut the suspension cable to the requested length with side cutters
7. Remove approx. 10 cm of the cable mantle, strip off approx. 1 cm of the wire ends, insert the filter adapter

8. Shift the seal screw, cone sleeve and seal cone to the suspension cable and insert the cable into the screwed socket, insert the wire ends through the cable entry into the mounting plate

The work steps are finished.

6.5 How to proceed if a repair is needed

You can find a repair form as well as detailed information on how to proceed at www.vega.com/downloads and "*Forms and certificates*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact the agency serving you to get the address for the return shipment. You can find the agency on our home page www.vega.com.

7 Dismount

7.1 Dismounting steps

Warning:
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel or pipeline, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

7.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the parts to be easily separable.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

8 Supplement

8.1 Technical data

Materials and weights

Materials, wetted parts

– Transmitter	316L, 1.4462 (Duplex), 1.4462 (Duplex) with PE coating, PVDF, Titanium
– Protective cap	PA, PE
– Diaphragm	sapphire ceramic® (99.9 % oxide ceramic)
– Joining material diaphragm/Basic element measuring cell	Glass solder
– Measuring cell seal - single	FKM (VP2/A) - FDA and KTW approved, FFKM (Perlast G75S), FFKM (Kalrez 6375), EPDM (A+P 75.5/KW75F)
– Measuring cell seal - double	FKM (VP2/A)+FKM (VP2/A), FFKM (Perlast G75S)+FKM (V75J), FFKM (Kalrez 6375)+ FFKM (Kalrez 6375), EPDM (A+P 75.5/KW75F)+EPDM (A+P 75.5/KW75F)
– Suspension cable	PE (FDA and KTW-approved), FEP, PUR
– Cable gland on the transmitter	316L
– Cable seal with PE, PUR suspension cable	FKM
– Cable seal with FEP suspension cable	FEP
– Straining clamp	316L
– Unassembled screw connection	316L, PVDF
– Threaded connection on the housing	316L

Materials, non-wetted parts

– Housing	plastic PBT (Polyester), 316L
– Type label support on suspension cable	PE hard
– transport protection net	PE

Weight approx.

– Basic weight	0.8 kg (1.764 lbs)
– Suspension cable	0.1 kg/m (0.07 lbs/ft)
– Straining clamp	0.2 kg (0.441 lbs)
– Threaded fitting	0.4 kg (0.882 lbs)
– Plastic housing	0.8 kg (1.764 lbs)
– Stainless steel housing	1.6 kg (3.528 lbs)

Input variable

Adjustment

Adjustment range of the min./max. adjustment relating to the nominal measuring range:

– Percentage value	-10 … 110 %
– Pressure value	-20 … 120 %

Recommended max. turn down 10 : 1 (no limitation)

Nominal measuring ranges and overload capability in bar/kPa

The specifications are only an overview and refer to the measuring cell. Limitations due to the material and version of the process fitting are possible. The specifications on the nameplate apply.

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
Gauge pressure		
0 … 0.1 bar/0 … 10 kPa	15 bar/1500 kPa	-0.2 bar/-20 kPa
0 … 0.2 bar/0 … 20 kPa	20 bar/2000 kPa	-0.4 bar/-40 kPa
0 … 0.4 bar/0 … 40 kPa	30 bar/3000 kPa	-0.8 bar/-80 kPa
0 … 1 bar/0 … 100 kPa	35 bar/3500 kPa	-1 bar/-100 kPa
0 … 2.5 bar/0 … 250 kPa	50 bar/5000 kPa	-1 bar/-100 kPa
0 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	-1 bar/-100 kPa
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	-1 bar/-100 kPa
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	-1 bar/-100 kPa
Absolute pressure		
0 … 1 bar/0 … 100 kPa	35 bar/3500 kPa	0 bar abs.
0 … 2.5 bar/0 … 250 kPa	50 bar/5000 kPa	0 bar abs.
0 … 5 bar/0 … 500 kPa	65 bar/6500 kPa	0 bar abs.
0 … 10 bar/0 … 1000 kPa	90 bar/9000 kPa	0 bar abs.
0 … 25 bar/0 … 2500 kPa	130 bar/13000 kPa	0 bar abs.

Nominal measuring ranges and overload capacity in psi

The specifications are only an overview and refer to the measuring cell. Limitations due to the material and version of the process fitting are possible. The specifications on the nameplate apply.

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
Gauge pressure		
0 … 1.5 psig	200 psig	-3 psig
0 … 3 psig	290 psig	-6 psig
0 … 6 psig	430 psig	-12 psig
0 … 15 psig	500 psig	-15 psig
0 … 35 psig	700 psig	-15 psig
0 … 70 psig	950 psig	-15 psig
0 … 150 psig	1300 psig	-15 psig
0 … 350 psig	1900 psig	-15 psig
0 … 900 psig	2900 psig	-15 psig
Absolute pressure		
0 … 15 psi	500 psi	0 psi
0 … 35 psi	700 psi	0 psi

Nominal range	Overload capacity, max. pressure	Overload capacity, min. pressure
0 … 70 psi	900 psi	0 psi
0 … 150 psi	1300 psi	0 psi
0 … 350 psi	1900 psi	0 psi

Output variable

Output signal	4 … 20 mA
Signal resolution	4 µA
Fault signal	22 mA
Max. output current	22 mA
Run-up time	
– with deviation ≤ 0.2 % approximately	2 s
– with deviation ≤ 0.1 % approximately	15 s
Step response time	
– with deviation ≤ 0.2 % approximately	≤ 100 ms (ti: 0 s, 0 … 63 %)
– with deviation ≤ 0.1 % approximately	≤ 200 ms (ti: 0 s, 0 … 63 %)

Reference conditions and actuating variables (according to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1	
– Temperature	+15 … +25 °C (+59 … +77 °F)
– Relative humidity	45 … 75 %
– Air pressure	860 … 1060 mbar/86 … 106 kPa (12.5 … 15.4 psig)
Determination of characteristics	Limit point adjustment according to IEC 61298-2
Characterstic curve	Linear
Reference installation position	upright, diaphragm points downward
Influence of the installation position	< 0.2 mbar/20 Pa (0.003 psig)

Deviation determined according to the limit point method according to IEC 60770[4)]

Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Deviation with version < 0.2 %	
– Turn down 1 : 1 up to 5 : 1	< 0.2 %
– Turn down up to 10 : 1	< 0.04 % x TD
Deviation with version < 0.1 %	
– Turn down 1 : 1 up to 5 : 1	< 0.1 %
– Turn down up to 10 : 1	< 0.02 % x TD

Influence of the medium or ambient temperature

Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Average temperature coefficient of the zero signal

[4)] Incl. non-linearity, hysteresis and non-repeatability.

In the compensated temperature range of 0 … +80 °C (+32 … +176 °F), reference temperature 20 °C (68 °F).

Average temperature coefficient of the zero signal upon execution < 0.2 %

- Turn down 1 : 1 < 0.15 %/10 K
- Turn down up to 5 : 1 < 0.2 %/10 K
- Turn down up to 10 : 1 < 0.25 %/10 K

Average temperature coefficient of the zero signal upon execution < 0.1 %

- Turn down 1 : 1 < 0.05 %/10 K
- Turn down up to 5 : 1 < 0.1 %/10 K
- Turn down up to 10 : 1 < 0.15 %/10 K

Outside the compensated temperature range:

Average temperature coefficient of the zero signal

- Turn down 1 : 1 typ. < 0.15 %/10 K

Thermal change, current output

Applies also to the **analogue** 4 … 20 mA current output and refers to the set span.

Thermal change, current output < 0.15 % at -40 … +80 °C (-40 … +176 °F)

Long-term stability (according to DIN 16086, DINV 19259-1 and IEC 60770-1)

Specifications refer to the set span. Turn down (TD) = nominal measuring range/set span.

Long-term drift of the zero signal < (0.1 % x TD)/year

Total deviation (acc. to DIN 16086)

The total deviation F_t, also called practical deviation, is the sum of the basic accuracy F_p and long-term stability:

$F_t = F_p + F_s$

$F_{perf} = \sqrt{((F_T)^2 + (F_{KI})^2)}$

With

- F_t: F_{total}, total deviation
- F_p: F_{perf}, basic accuracy
- F_s: F_{stab}, long-term drift
- F_T: Temperature coefficient (influence of medium or ambient temperature)
- F_{KI}: Deviation

Ambient conditions

Ambient temperature

- Suspension cable PE -40 … +60 °C (-40 … +140 °F)
- Suspension cable PUR, FEP -40 … +80 °C (-40 … +176 °F)

Storage and transport temperature -40 … +80 °C (-40 … +176 °F)

Process conditions

Max. process pressure, transmitter[5)]

- Measuring range 0.1 bar (1.45 psig) — 15 bar (218 psig)
- Measuring range 0.2 bar (2.9 psig) — 20 bar (290 psig)
- Measuring ranges from 0.4 bar (5.8 psig) — 25 bar (363 psig)

Pressure stage, process fitting

- Unassembled screw connection — 316L: PN 3, PVDF: unpressurized
- Thread on the housing — PN 3

Product temperature, depending on the version

Suspension cable	Transmitter	Product temperature
PE	All	-20 … +60 °C (-4 … +140 °F)
PUR	All	-20 … +80 °C (-4 … +176 °F)
PUR	PE coating	-20 … +60 °C (-4 … +140 °F)
FEP	All	-20 … +80 °C (-4 … +176 °F)
FEP	PE coating	-20 … +60 °C (-4 … +140 °F)

Vibration resistance — mechanical vibrations with 4 g and 5 … 100 Hz[6)]

Electromechanical data

Suspension cable

- Configuration — six wires, one suspension wire, one breather capillary, screen braiding, foil, mantle
- Wire cross-section — 0.5 mm^2
- Wire resistance — ≤ 0.036 Ω/m
- Tensile strength — ≥ 1200 N (270 pound force)
- Max. length — 1000 m (3280 ft)
- Min. bending radius — 25 mm (with 25 °C/77 °F)
- Diameter approx. — 8 mm (0.315 in)
- Cable extraction force — ≥ 650 N (146.1 lbf)
- colour (non-Ex/Ex) - PE — black/blue
- colour (non-Ex/Ex) - PUR, FEP — blue/blue

Cable entry housing — 1 x cable gland M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind plug M20 x 1.5

Screw terminals for cable cross-section up to — 1.5 mm^2 (AWG 16)

5) Limited by the overpressure resistance of the measuring cell.

6) Tested according to the guidelines of German Lloyd, GL directive 2.

Voltage supply	
Operating voltage U_B	
– Non-Ex instrument, deviation < 0.2 %	8 … 35 V DC
– Non-Ex instrument, deviation < 0.1 %	9.6 … 35 V DC
– Ex-ia instrument	9.6 … 30 V DC
Permissible residual ripple	
– < 100 Hz	U_{ss} < 1 V
– 100 Hz … 10 kHz	U_{ss} < 10 mV
Reverse voltage protection	Available
Load resistor	
– Calculation	$(U_B - U_{min})/0.022$ A
– Example - Non-Ex instrument with U_B= 24 V DC	(24 V - 9.6 V)/0.022 A = 655 Ω

Integrated overvoltage protection	
Nominal leakage current (8/20 µs)	5 kA
Min. response time	< 25 ns

Potential connections in the instrument	
Electronics	Not non-floating
Galvanic connection between	Transmitter, screen of the suspension cable as well as metallich process fitting and ground terminal on the housing

Electrical protective measures	
Protection rating	
– Transmitter	IP 68 (30 bar)
– Housing	IP 66/IP 67
Overvoltage category	III
Protection class	III

Approvals

Instruments with approvals can have different technical specifications depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under www.vega.com via "*VEGA Tools*" and "*Instrument search*" as well as via "*Downloads*" and "*Approvals*".

8.2 Dimensions

VEGAWELL 52, 316L/Titanium 22 mm

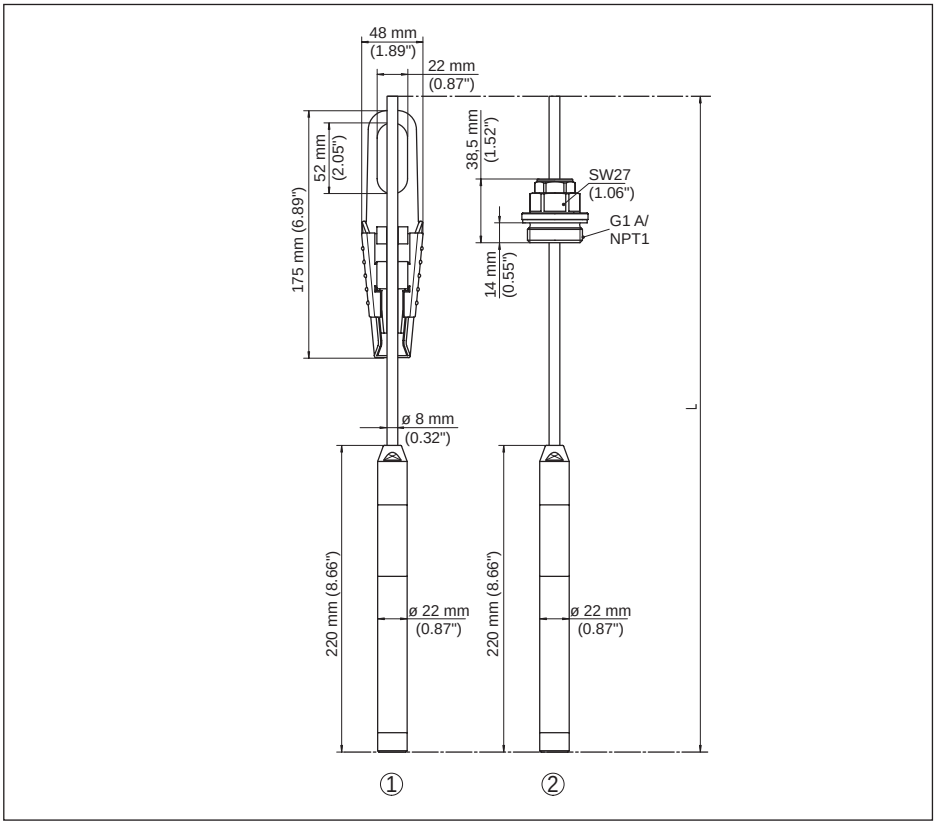

Fig. 15: VEGAWELL 52, with transmitter 316L/Titanium 22 mm

1 Transmitter with straining clamp
2 Transmitter with unassembled threaded fitting

VEGAWELL 52, Titanium 33 mm

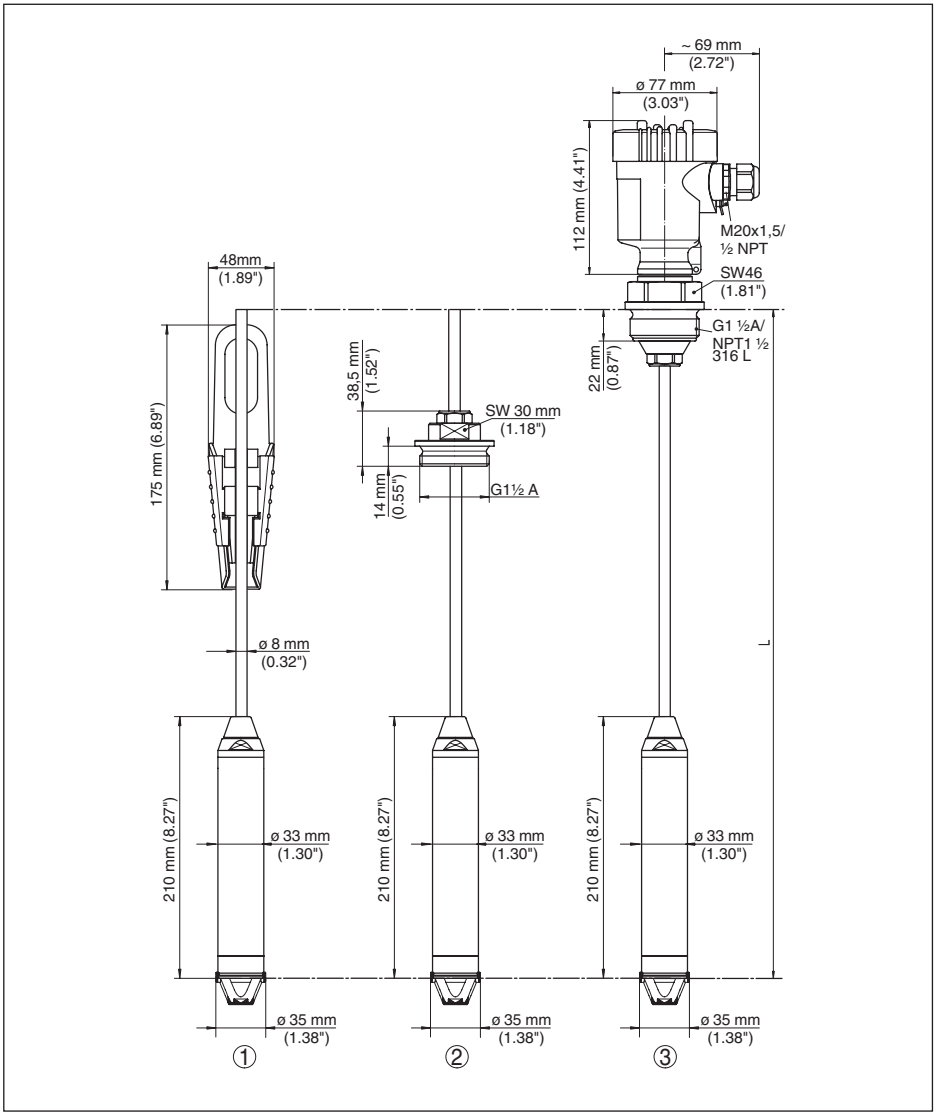

Fig. 16: VEGAWELL 52, with transmitter 316L/Titanium 33 mm

1 *Transmitter of titanium with straining clamp*
2 *Transmitter of titanium with unassembled threaded fitting*
3 *Transmitter of titanium with thread and plastic housing*

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VEGAWELL 52, Duplex/PVDF

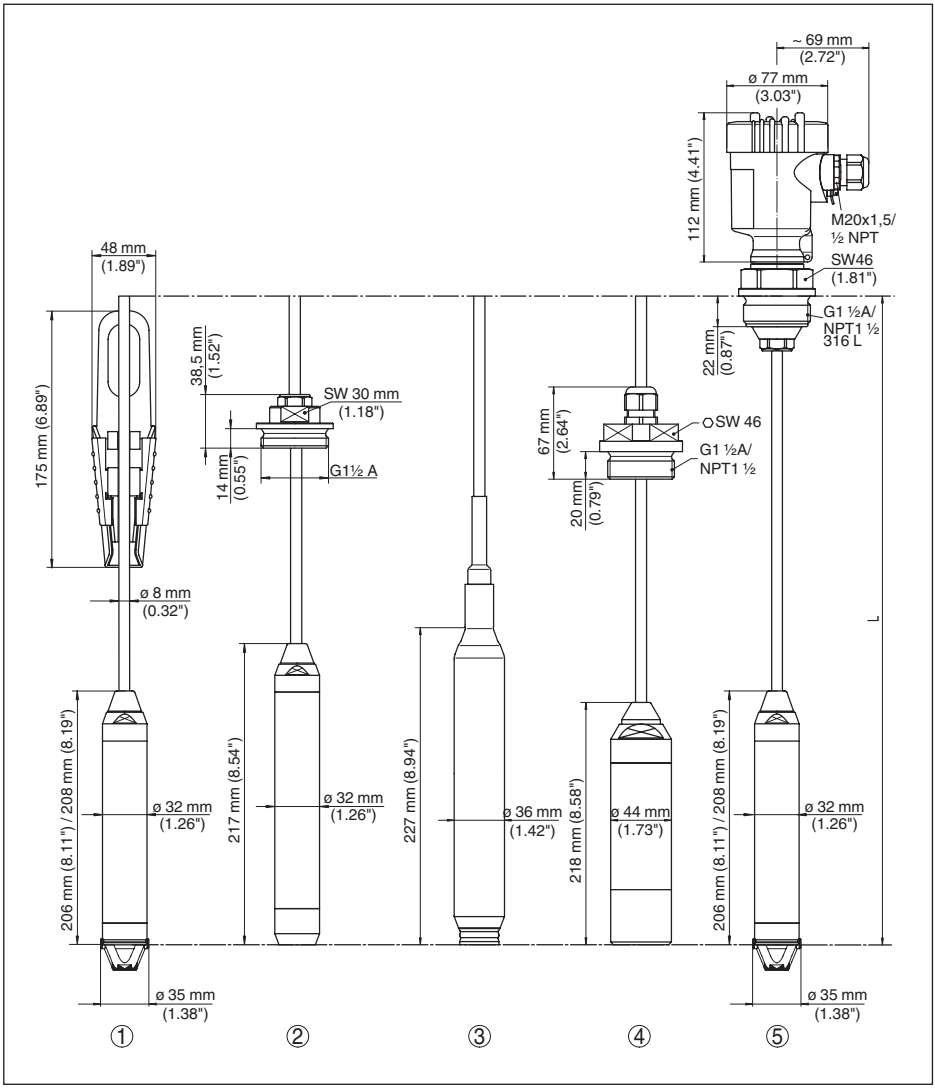

Fig. 17: VEGAWELL 52, with transmitter Duplex/PVDF

1 *Transmitter Duplex standard/double seal with straining clamp*
2 *Transmitter Duplex for deep wells (end cap) with unassembled threaded fitting*
3 *Transmitter Duplex with PE coating*
4 *Transmitter with screwed connection of PVDF*
5 *Transmitter Duplex standard/double seal with thread and plastic housing*

VEGAWELL 52, Duplex threaded fitting

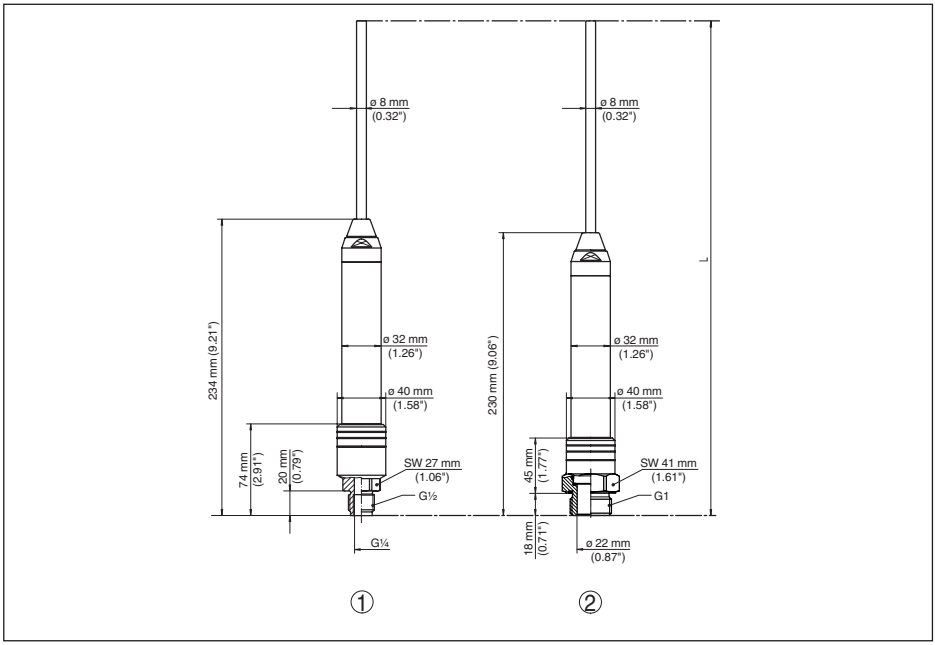

Fig. 18: VEGAWELL 52, with threaded fitting and transmitter Duplex

1 Threaded fitting G½ inner G¼
2 Threaded fitting G1

8.3 Industrial property rights

VEGA product lines are global protected by industrial property rights. Further information see www.vega.com.

Only in U.S.A.: Further information see patent label at the sensor housing.

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8.4 Trademark

All the brands as well as trade and company names used are property of their lawful proprietor/ originator.

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